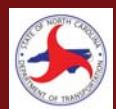# North Carolina Traffic Records Guidebook

2008 Edition

North Carolina Traffic Records Guidebook
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Chapter 1

Introduction

Traffic crashes are a serious issue in North Carolina. According to the North Carolina Department of Transportation (NCDOT), 675,700 crashes were reported on North Carolina highways from 2005 to 2007. Of these crashes, 224,126 were injury crashes and 4,314 resulted in fatalities. In response, many agencies of state and local government have made highway safety a priority.

North Carolina has an active community of highway safety professionals, in several different agencies. Several of these agencies maintain databases, some of which are used by people outside the host agency. In some cases, these databases are linked and merged to accomplish safety-related tasks. In this way, one might say that there exists a North Carolina highway safety information system. In fact, the North Carolina Traffic Records Coordinating Committee (TRCC) has been formed and has operated within the State during the past few years to make the system as efficient as possible. The TRCC website (http://www.hsrc.unc.edu/nctrcc/) describes its activities.

The TRCC has recommended that a guidebook documenting the highway safety information system in North Carolina should be assembled and this document is the result. The TRCC hopes that this Guidebook is used by a wide variety of professionals and others to help answer key questions in highway safety. The Guidebook was written for professionals – engineers, planners, health care workers, police officials, and others – who have an interest in or a job to do in highway safety. These professionals may know that they need data from outside their agency, but do not know where to turn for those needed data. The TRCC will consider this Guidebook a success if professionals working in safety use it to find out whom to call for the data they need. The Guidebook assumes that readers have only general knowledge of computer and database practices. Students, interested citizens, news media, politicians, and others may also find this Guidebook handy to find needed highway safety data.

The TRCC was inspired to prepare this Guidebook, in part, by a similar effort in Wisconsin. The Wisconsin Resource Guide outlines Wisconsin's highway safety-related databases, information processing within safety-oriented state agencies, transmission and access tools, and the organizations and policy groups that determine the content and use of the data. Information pertaining to the nature and quality of the data, the purpose of the data, how and where it is stored, the point of contact, and how the data may be accessed is also incorporated in the Wisconsin Resource Guide.

This Guidebook is a catalogue of data sources that can be used to analyze motor vehicle-related crashes, injuries, and deaths. It also contains information about the tools for data transmission and access, and about organizations that determine the content and use of the data. The main goals of this Guidebook are the following:

- Pull together in one place a list of the major databases and systems and the key characteristics of each;

- Increase all potential users' understanding of the quality and limitations of the available data;

- Streamline user access to the data; and

- Provide resources and direction to users seeking further information.

To achieve these goals, information was gathered from highway safety professionals through use of a questionnaire and in-person interviews. The questionnaire was modeled after the North Carolina Traffic Records System Status Sheets that were distributed to the TRCC data system owners in 2006. A copy of the questionnaire that was utilized to compile this Guidebook can be found immediately following the Introduction. The agency representatives who completed the questionnaires were either members of the TRCC, and thus quite familiar with the goals of this Guidebook, or the lead persons responsible for the data and systems maintained by that agency. A complete listing of the agencies and professionals that were interviewed is provided in the Acknowledgements section following the Introduction. Contact information is provided within each chapter.

The guidebook is organized into chapters representing the major databases and systems that comprise the North Carolina highway safety information system. Each chapter contains a brief introduction, followed by a description of the database or system and its key characteristics pertaining to:

- Timeliness;
- Completeness;
- Format/Database Type;
- Reliability;
- Interoperability;
- Accessibility;
- Utility; and
- Existing links between databases.

In addition to documenting each of the above characteristics, this Guidebook also contains charts that illustrate how the different systems are linked and how data flow from one system to another. The charts can be found in the Conclusion of this guidebook.

Readers should note that highway safety databases are dynamic. They change constantly due to new technologies, new people involved, new agency missions and roles, and for a variety of other reasons. The interviews conducted for this effort were in the summer of 2008, and the information may not be correct or relevant at some point in the future. The TRCC hopes that efforts are made in the future to keep this Guidebook current; in the meantime, users should be aware that some information in this Guidebook may have changed.

NC Traffic Records Guide Questionnaire

Agency/Database: _____   Date: _____

Interviewee: _____

Title: _____

Contact Info: _____

Introduction - General

Why was this database assembled? What was the main objective?

In what year was the database established? What is the earliest record?

What is the reporting procedure? How did the data get into the database?

Timeliness

How current are the data, or how soon after the event is the information available?

How often are the data updated?

How often, if ever, are the data purged?

Completeness

Is a data dictionary available on the web or by request? (list of elements and attributes)

How often are these resources updated?

How can extracted data be transmitted?

How complete are the data in terms of accepted content standards, as well as actual capture of all data within the system? Are there any missing data?

What are the reporting thresholds?

What is the geographic extent of the data? All levels of government (city and county)?

Database Type

What format are the data in?

<u>Reliability</u>

How reliable are the data?

Where applicable, are the collected data geo-coded? What type of linear referencing system (LRS) is utilized (county milepost, state route milepost, GPS coordinates, other)?

What quality control measures are currently in place?

Are the data edited? If so, by whom?

<u>Interoperability</u>

What are the key fields?

Can the data be moved, shared, or linked with other federal, state, and/or local systems?

Is other documentation available besides the data dictionary?

Accessibility

Who can, or may need to, access the data?

What published reports are available? Are there any other publications or standard reports, web query tools, useful web pages, etc?

What is the procedure to obtain the data?

Who is the responsible person or agency?

What costs, if any, are associated with accessing the data?

Are the data available online?

Is training needed or required to obtain or use the data?

<u>Utility</u>

Are there any restrictions on use of the data?

<u>Existing Links</u>

What links to other traffic records systems currently exist?

<u>Other</u>

What general statutes cover the collection, storage, and/or use of the data? (list of state laws that relate to the TRCC data sets)

What are your suggestions for the next improvements to this database?

<u>Summary / Overview</u>

Chapter 2

"Nearly six million police-reported motor vehicle crashes occurred in the United States in 2005. Fewer than one third of these crashes (1.75 million) resulted in an injury and, and fewer than one percent (38,588) resulted in a death."

- 2006 Motor Vehicle Crash Data from FARS and GES

Introduction

The North Carolina Division of Motor Vehicles (NC DMV) maintains a database that contains information on all reported crashes in the state. The database was assembled to serve as a single electronic repository for all crash data. One of the main objectives of the crash database is to make records and related data available to the law enforcement community. The current Crash Reporting System (CRS) was established in 1999, and the earliest record dates back to 1990.

Crash data may either be submitted electronically using the DMV TRCS application or manually through a written crash report form (DMV-349). The TRCS application enables law enforcement to electronically complete and submit crash reports directly to the CRS from the field. An Appendix following this chapter provides more details on TRCS. Written crash reports are received by DMV and scanned. Data entry staff key information from the scanned images stored in the database.

Timeliness

Crash report data that are electronically submitted through TRCS are typically available within two days after DMV receives the report. Crash data that must be manually entered from the DMV-349 form are usually available within 30 days after the DMV receives the report. Updates to the CRS database are made on a daily basis. The data are never purged.

Completeness

A CRS data dictionary is available upon request. It is updated periodically, as needed or requested by the DMV Traffic Records Branch. Business rules are in place to ensure the completeness of the data. Only reportable crash data are typically entered into the CRS database; however, data are entered for all crashes that are reported, even those that may not fit the criteria of a reportable crash. A reportable crash must meet at least one of the following criteria:

- The crash resulted in a human fatality, or
- The crash resulted in a non-fatal personal injury, or
- The crash resulted in greater than $1,000 of total property damage, or
- The crash resulted in property damage of any amount to a seized vehicle.

All law enforcement agencies are required to report crashes that they respond to that meet one or more of the criteria.

For more information, contact:

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Database Type

CRS data are stored in an Oracle database. In events where crash data were captured manually on the DMV-349 form, the report is scanned, complete with narrative and sketch, and stored in the database.

Reliability

The crash data are geo-coded using the county milepost linear referencing system. To ensure reliability, the data undergo a series of business rule checks. In addition, field validation tools are incorporated into TRCS and CRS to control the quality of the captured data.

Business users within the Division can edit data to apply supplemental changes provided by the officers. The users can also edit the data for corrections based on documentation and approvals from the Traffic Records Director. NCDOT Traffic Safety Engineers can correct crash location information.

Interoperability

Every crash has a unique Crash Identifier Number which can be used to locate a crash. Database queries are generally based on the Crash Identifier Number or one of the following key fields:

- Crash Date;
- Crash Time;
- Driver Information;
- Vehicle Information; and
- Injury Information

As noted below, crash data from the CRS are replicated and placed in the NCDOT Traffic Engineering Accident Analysis System (TEAAS). Most queries of crash data based on location are performed using TEAAS.

In addition to maintaining the state's crash data repository, the DMV also provides crash data to Federal programs such as SAFETYNET and is the lead agency supplying data to the Fatality Analysis Reporting System (FARS).

The following documents provide additional documentation on crash data:

- North Carolina Crash Report Form DMV-349 Pad
- North Carolina Crash Report Instruction Manual
- Comprehensive Business Rules and Field Validations

The North Carolina Crash Report Form DMV-349 Pad and the North Carolina Crash Report Instruction Manual provide codes, values, and assistance to law enforcement officers when they enter a crash report. Comprehensive Business Rules and Field Validations documentation is available for online reporting via TRCS.

Accessibility

Several published reports based on the CRS are available to the public, including the Crash Facts Book, the Fatality Report, and the Holiday Report. These reports are published annually and contain various statistical data for crashes that have been reported in the state.

The DMV, other state agencies, local governments (counties and cities), the Federal Government, researchers, businesses, and citizens all can, or may need to, access crash data. Refer to the Utility section of this chapter for restrictions on the use of crash data.

To obtain data or online access to records, the Division requires a written request to be sent to the Data Security Coordinator in the DMV Traffic Records Branch. The request must identify the specific data needs and how the data will be used. The Branch will respond to each requester. CRS data are available online to authorized users. Authorized users are given "read only" access to the data through CrashWeb. Sufficient training to become familiar with the specific data sets is necessary to effectively use the data.

Fees and costs for motor vehicle records are established by general statutes and are subject to legislative review and changes. There is a fee associated with certified individual crash reports. It is anticipated that a fee per record will be implemented in the future for all crash reports. Charges for other data requests requiring programming resources are set at a per hour rate, with the estimated cost disclosed during the initial data request approval process.

Utility

The Federal Driver Privacy Protection Act (DPPA) and NC General Statutes restrict access to personal information in DMV records to only those entities that qualify. State law further restricts disclosure of personal information.

Existing Links

Several links between the crash database and other traffic records systems currently exist, and include the following:

*   NCDOT Traffic Engineering Accident Analysis System (TEAAS)
*   State Automated Driver License System (SADLS)
*   State Titling and Registration System (STARS)
*   Fatality Analysis Reporting System (FARS)
*   SAFETYNET

Crash data are replicated and placed in the NCDOT Traffic Engineering Accident Analysis System (TEAAS) database for mile-posting and safety engineering analysis and reports. The crash database links to SADLS to allow analysts to perform searches of individual drivers and allow crashes to be posted to driver records. The link to STARS enables vehicle identification number (VIN) and license plate searches. The DMV is the lead agency for FARS reporting and is legislatively required to enter FARS data. Commercial motor vehicle crash data are extracted and sent to SAFETYNET on a daily basis. TEAAS is discussed in a separate chapter of this Guide, while an Appendix following this Chapter provides more details on FARS and SAFETYNET.

Appendix – Related Functions

TRCS

NC TraCS is the NC DMV's implementation of the national model of the Traffic and Criminal Software (TraCS) package. TraCS enables law enforcement officers to record and retrieve incident information from the field wherever and whenever an incident occurs. The NC DMV Traffic Records Communications System (TRCS) is an enhancement of the current Crash Reporting System (CRS) that enables DMV to receive and process crash reports electronically.

NC TraCS and DMV TRCS are collectively referred to as TRCS and work together to allow officers to electronically collect and transmit crash information from the field to a central repository (i.e., CRS). TRCS allows an officer to collect and validate information in his or her vehicle using a notebook computer or at a local office using a workstation. TRCS can obtain driver and vehicle information corresponding to a driver license or a vehicle (plate or VIN) from the State Titling and Registration System (STARS) and State Automated Driver License System (SADLS) through the crash database.

The primary objective of TRCS is to maintain a paperless system where creation, validation, and transmission of crash data are performed electronically. In the process of accomplishing this objective, TRCS also helps to reduce the time needed to create a crash report in the field. This translates to faster submittal of crash reports to DMV, and in turn, expedited public availability of crash data.

FARS

The Fatality Analysis Reporting System (FARS) contains data for fatal traffic crashes that occur within the 50 states, the District of Columbia, and Puerto Rico. To be included in FARS, a crash must involve a motor vehicle traveling on a public roadway and result in the death of a person (occupant of a vehicle or a non-motorist) within 30 days of the crash.

FARS was developed by the National Center for Statistics and Analysis (NCSA) of the National Highway Traffic System Administration (NHTSA) in 1975. The main objectives of FARS include:

•	Provide an overall measure of highway safety;
•	Identify traffic safety problems and solutions; and
•	Provide an objective basis to evaluate the effectiveness of motor vehicle safety standards and highway safety initiatives.

NHTSA has a cooperative agreement with an agency in each State's government to provide information on all qualifying crashes in the State. In North Carolina, the DMV is the lead agency for FARS reporting. FARS data are obtained solely from the State's existing documents, which include the following:

•	Police crash reports;
•	State vehicle registration files;
•	State driver licensing files;
•	State Highway Division data;
•	Vital statistics;
•	Death certificates;
•	Coroner/Medical Examiner reports;
•	Hospital medical reports;
•	Emergency medical service reports; and
•	Other State records.

More than 100 FARS data elements are coded from the documents above. The specific data elements may be modified slightly each year to conform to changing use needs, vehicle characteristics, and highway safety emphasis areas. The data included in FARS do not include any personal identifying information, such as names, addresses, or social security numbers. Thus, data kept in FARS files and made available to the public fully conform to the federal Driver Privacy Protection Act.

Fatal crash data for each State are entered into a local microcomputer data file, and daily updates are sent to NHTSA's central computer database. Data are automatically checked when entered for acceptable range values and for consistency. This makes it possible for corrections to be made immediately.

Each year, FARS data are utilized by the NCSA to publish a Traffic Safety Facts report. The report compiles fatal crash data from FARS and non-fatal crash data from the General Estimates System (GES). The purpose of the Traffic Safety Facts report is to present statistics about traffic crashes of all severities.

Useful Resources

http://www-nrd.nhtsa.dot.gov/departments/nrd-01/summaries/FARS_98.html - FARS
http://www.nhtsa.dot.gov/people/ncsa/ - National Center for Statistics and Analysis
http://www.nhtsa.dot.gov/ - National Highway Traffic System Administration
http://www-nrd.nhtsa.dot.gov/Pubs/TSF2006FE.PDF - Traffic Safety Facts (2006)

SAFETYNET – Commercial Motor Vehicle Crash Reporting

SAFETYNET is a computer system utilized by state law enforcement agencies and the Federal Motor Carrier Safety Administration (FMCSA) for the collection and management of commercial vehicle safety data. Data are collected from all safety inspections and compliance reviews performed in North Carolina and all qualifying crashes that occur on North Carolina highways. The DMV maintains commercial motor vehicle (CMV) crash data in the crash database. The Division is responsible for forwarding CMV crash data to the NC State Highway Patrol, who enter the data into SAFETYNET. See the Chapter elsewhere in this document with a more complete description of SAFETYNET as maintained by the State Highway Patrol. SAFETYNET data are routinely transferred to the Motor Carrier Management Information System (MCMIS) for analysis by FMCSA and are used to help determine a motor carriers' safety fitness rating. The system also allows for the electronic collection of inspection data from roadside inspection software.

FMCSA's SAFETYNET Crash Module records qualifying vehicles involved in crashes that are motor vehicle traffic crashes as defined in the ANSI D-16 Manual on the Classification of Motor Vehicle Traffic Accidents. To satisfy the definition of a motor vehicle traffic crash, the crash must not be the result of a deliberate act (e.g., suicide, police intervention) or a cataclysm (e.g., hurricane, flood). A crash must also meet the following criteria to be sent to SAFETYNET:

1.   The crash must result in at least one of the following:
   •   Fatality;
   •   Injury; or
   •   Towed vehicle.

2.   Commercial vehicles must:
   •   have a gross vehicle weight rating (GVWR) > 10,000 pounds; or
   •   carry hazardous materials.

3.   Non-commercial vehicles must have one of the following vehicle styles:
   •   Commercial bus;
   •   School bus;
   •   Activity bus;
   •   Other bus;
   •   Light truck (carrying nine or more occupants);
   •   Sport utility vehicle (carrying nine or more occupants); or
   •   Van (carrying nine or more occupants).

Useful Resources

http://www.fmcsa.dot.gov/ - FMCSA

http://www.dot.gov/pia/fmcsa_mcmis.htm - Motor Carrier Management Information System

http://www.nccrimecontrol.org/ - North Carolina State Highway Patrol

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Chapter 3

> "To obtain data or online access to records, one should send a written request to the Data Security Coordinator of the DMV Traffic Records Branch. The request must identify the specific data needs and how the data will be used. The Branch will respond to each requestor."

For more information, contact:

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Introduction

The North Carolina Division of Motor Vehicles (NC DMV) maintains the State Automated Driver License System (SADLS), which contains NC driving records data. SADLS went into live production on November 24, 1994. The earliest driver license record stored in the system is from October, 14 1966.

Online data are processed in real time as received from various states/agencies via the American Association of Motor Vehicle Administrators Network (AAMVANet) interface. Some data files provided by outside agencies, such as the Administrative Office of the Courts (AOC), are not received through AAMVANet and are processed by batch each workday.

Timeliness

Updates made to a driver record as the result of the driver turning in his or her NC license and applying for a license in another state are made in real time. In addition, another example of real time updates includes any updates resulting from receipt of customer information from the Social Security Administration.

Overnight data updating is primarily adjudicatory in nature, and involves updating the driving record based on convictions received from the AOC. The updated record is then and applied against the standards to determine whether a suspension should result. It could also involve updating the driving record when a suspension ends or updating status information for the recently deceased.

SADLS data are not purged.

Completeness

A SADLS data dictionary is available upon request. It is updated whenever changes are made to the dataset.

Data are entered into SADLS when received from authorizing authorities, for example, the AOC. Data extracted from SADLS can be transmitted via secure FTP, printed reports, a web browser, or remote file access. Since implementation of SADLS, data have conformed to established data standards, making the data very complete. SADLS not only contains driver information reported from NC agencies, but also driver information reported from out of state.

Database Type

SADLS is a DB2 database.

Reliability

SADLS data are considered extremely reliable. Quality control measures, such as online screen edits, code validations, online editing restrictions, and address validation, are in place to ensure that the data are reliable. SADLS data are edited as necessary by authorized supervisory personnel and the DMV Help Desk. The data are not geo-coded.

Interoperability

Key fields in SADLS include the driver name and the driver license number.

SADLS is linked with local, state, and federal law enforcement agencies, all state DMV agencies, various other state agencies such as the AOC and the State Board of Elections, and various federal agencies such as the Social Security Administration, Selective Service System, Transportation Security Administration. Data are shared and updated as required on a daily basis, 24 hours per day during mainframe availability.

Other SADLS documentation besides the data dictionary is available, but it is mostly geared toward programming of the system and would not likely be useful to the public. There are also process manuals that are maintained as physical documents and adjusted as policy changes occur, but these documents are not readily available online to the public.

Accessibility

The DMV provides no standard reports relating to driver data, and no web query tools are available at this time.

The DMV, other state agencies, local governments (counties and cities), the federal government, researchers, businesses, and citizens all can, or may need to, access SADLS data. Refer to the Utility section of this chapter for restriction on the use of the data. To obtain data or online access to records, one should send a written request to the Data Security Coordinator of the DMV Traffic Records Branch. The request must identify the specific data needs and how the data will be used. The Branch will respond to each requestor.

SADLS data are available online to authorized users, such as other state agencies and counties. The users must have a valid identification number to access individual motor vehicle records through the DMV website. Access to bulk data is not available through the DMV website. Sufficient training to become familiar with the specific data sets is necessary to effectively use the data.

Fees and costs for motor vehicle records are established by general statutes and are subject to legislative review and changes. Entities with online access to individual driver records must pay a fee per record. Other data requests requiring programming resources are set at a per hour rate. An estimated cost is provided during the initial request approval process.

Utility

The Federal Driver Privacy Protection Act (DPPA) and NC General Statutes restrict access to personal information in DMV records to only those entities that qualify. State law further restricts disclosure of personal information.

Existing Links

SADLS interfaces with DMV traffic records systems (vehicle and crash records) to provide driver information.

Useful Resources

http://www.ncdot.org/dmv/ - North Carolina Division of Motor Vehicles (NC DMV)

http://www.aamva.org/ - American Association of Motor Vehicle Administrators (AAMVA)

http://www.nccourts.org/ - Administrative Office of the Courts (AOC)

http://www.sboe.state.nc.us/ - State Board of Elections

http://www.tsa.gov/ - Transportation Security Administration (TSA)

http://www.accessreports.com/statutes/DPPA1.htm - Federal Driver Privacy Protection Act (FDPPA)

The following sources provide more information on the laws and statutes that cover the collection, storage, and/or use of crash data:

   •   Motor Vehicle Laws of North Carolina – Chapter 20 (Suggested references: 20-166.1; 20-26; 20-43, 20-43.1; 20-85; 20-52; 20-56; 20-50.3; 20-43.2; 20-43.4; 20-79.7)
   •   North Carolina Administrative Code 19A

Chapter 4

"STARS data are very complete and cover all registration and titling services performed statewide. "

For more information, contact:

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Introduction

The State Titling and Registration System (STARS) is a database maintained by the North Carolina Division of Motor Vehicles (NC DMV) that was created to provide automated vehicle titling and registration services. STARS was established in 1996, and contains title records dating back to the year 1900 and registration records dating back to 1975. Data are entered into STARS by authorized employees at DMV branches. The data are entered using online STARS screens, which automatically transmit data to the database. In addition to online reporting, data are also reported through batch processes in which data are uploaded into STARS nightly.

Timeliness

Most STARS data are captured in real time; however, some data are updated through nightly batch processes. Data that are submitted online at DMV branches are real time, while registration renewals done via mail and the internet, for example, are input through nightly batch processes.

Title data are never purged from STARS. However, registration data older than four years are archived on a monthly basis.

Completeness

A data dictionary for STARS is available upon request from the DMV Data Control or Information Technology departments. The data dictionary is updated as needed, whenever changes are made to the dataset. Data extracted from STARS are typically transmitted online or through batch reports.

STARS data are very complete and cover all registration and titling services performed statewide. Data are entered into the system when a vehicle is registered or changes owners, or whenever there is a change in a vehicle's current registration or title information. Although data are collected on a statewide basis, users may perform queries by the city or county in which the vehicle is registered.

Database Type

STARS is a DB2 database.

Reliability

STARS data are considered to be very reliable. To ensure the reliability of the data, online and batch validations and edits are performed. Edits may be made based on user requirements, or to validate data such as customer address and vehicle information. Only authorized DMV employees have the ability to make edits. The data are not geo-coded, but can be reported based on geographical information such as city, county, state, and ZIP code.

Interoperability

Key fields in STARS include vehicle identifiers like VIN, make, model, body style, and plate number, as well as customer identifiers like name and address.

STARS data are routinely shared with other federal, state, and local systems, such as the Highway Patrol, courts, health and human resources, and individual counties. In addition to the data dictionary, other sources of STARS documentation include STARS user guides, detailed design documents, program specifications, and test plans. Most of these documents are stored on the NCDOT network and are not readily available to the public.

Accessibility

The DMV, other state agencies, local government (counties and cities), the Federal Government, researchers, businesses, and citizens all can, or may need, access STARS data. Refer to the Utility section of this chapter for restrictions on the use of the data. To obtain data or for online access to records, one should make a written request to the , Data Security Coordinator of the DMV Traffic Records Branch. The request must identify the specific data needs and how the data will be used. The Branch will respond to each requestor.

STARS data are available online to authorized users, such as other state agencies and counties. The users must have a valid identification code to access individual motor vehicle records through STARS online system. Access to bulk data is not available through the DMV website. Sufficient training to become familiar with the specific data sets is necessary in order to effectively use the data.

Fees and costs for motor vehicle records are established by general statutes and are subject to legislative review and changes. Entities with online access to individual records must pay a state Information Technology Services usage fee. Implementation of a fee per record is anticipated for vehicle and title records. Costs for data requests requiring programming resources are set at a per hour rate. An estimated cost is provided during the initial request approval process.

Utility

The Federal Driver Privacy Protection Act (DPPA) and NC General Statutes restrict access to personal information in DMV records to only those entities that qualify. State law further restricts disclosure of personal information.

Existing Links

STARS interfaces with traffic records systems (driver and crash records) to provide vehicle titling and registration information.

Useful Resources

http://www.ncdot.org/dmv/ - North Carolina Division of Motor Vehicles (NC DMV)

http://www.nccrimecontrol.org/ - North Carolina State Highway Patrol

http://www.ncdot.org/ - North Carolina Department of Transportation

http://www.accessreports.com/statutes/DPPA1.htm - Federal Driver Privacy Protection Act (DPPA)

http://www.ncga.state.nc.us/gascripts/Statutes/Statutes.asp - North Carolina General Statutes

The following sources provide more information on the laws and statutes that cover the collection, storage, and/or use of crash data:

- Motor Vehicle Laws of North Carolina – Chapter 20 (Suggested references: 20-166.1; 20-26; 20-43, 20-43.1; 20-85; 20-52; 20-56; 20-50.3; 20-43.2; 20-43.4; 20-79.7)
- North Carolina Administrative Code 19A

Chapter 5

"The ultimate benefactor of the TEAAS system is the population at large, as the primary goal of its use is to improve public safety along North Carolina's roadways." -

https://dmvcrashweb.dot.state.nc.us/TEAAS/History.htm
10/30/08

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Introduction

The Traffic Engineering Accident Analysis System (TEAAS) is the main tool used by the Traffic Engineering and Safety Systems Branch (TESSB) of the NCDOT to analyze and report on crashes that occur in the state. TEAAS is often used to help support policies and decisions at the state and federal levels. The TEAAS database is a nightly replication of the crash database maintained by the NC DMV. TEAAS was established in 1999 as a product of Y2K preparations, and went online on January 1, 2000. The earliest data on record is from 1990.

Timeliness

Since the TEAAS database is a replication of the DMV crash database, TEAAS data are only as timely as the data within the crash database. Crash data that are submitted to the DMV on the DMV-349 form are typically available within three months of the date of the crash. Electronic crash data submissions made through TRCS must be made within 48 hours of the crash, so these data are typically available within ten days of the date of the crash. TEAAS data are updated nightly with any new or changed data. The data are not purged.

Completeness

A TEAAS data dictionary is available upon request from the Traffic Engineering and Safety Systems Branch. Data extracted from TEAAS may be transmitted to approved entities in various ways, such as DVD or FTP. TEAAS data are considered to be very complete. All data captured within the standard DMV-349 form are also captured in TEAAS. Data are stored for all reportable crashes statewide. A reportable crash must meet at least one of the following criteria:

* The crash resulted in a human fatality, or
* The crash resulted in a non-fatal personal injury, or
* The crash resulted in greater than $1,000 of total property damage, or
* The crash resulted in property damage of any amount to a seized vehicle.

All law enforcement agencies are required to report crashes that they respond to that meet one or more of the criteria. However, crash reports may not always be received for crashes that occur in National Parks or on Indian Reservations.

Database Type

The TEAAS database is an Oracle database.

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Reliability

Overall, TEAAS data are very reliable and sufficient to answer the questions that need to be answered. For instance, it is estimated that location data are accurate in approximately 87% of fatal crashes and in approximately 75% of all crashes. Some typically less critical data, however, such as trailer width, may often be incorrect or missing. TEAAS data are geo-coded by county milepost; however, it is possible for the data to be converted to state route milepost and GPS coordinates if necessary.

To ensure reliability of the data before it even reaches TEAAS, the data undergo a series of business rules checks at the DMV. Field validation tools are incorporated into TRCS and the crash database (CRS) to control the quality of the captured data. Data are also monitored for any unusual patterns that could indicate potential problems. If the TESSB does identify an error in the data, the error is brought to the attention of the DMV so that the data may be updated. NCDOT Traffic Safety Engineers can correct crash location information, but have read-only access to the remainder of the data from DMV.

Interoperability

Some key fields in TEAAS are the Crash ID (assigned by DMV), driver license number, driver name, driver date of birth, and location of the crash. Crash location (route and milepost, address, or coordinates) is an important key field, allowing merges of crash data with GIS and other roadway data.

TEAAS data are often cited in reports to the federal government, and are also shared with the Federal Highway Administration's (FHWA). TEAAS is routinely linked to roadway and driver records files, and also has the capability to link to citation and medical data.

Accessibility

Units within the NCDOT, local government and law enforcement agencies, university partners such as the Institute for Transportation Research and Education (ITRE), and private engineering companies often request TEAAS data. To obtain data, the NCDOT requires a written request be sent to the TESSB Traffic Safety Engineer. Once a request is approved, the data may be given in large data dumps, rather than through direct access to the data. No raw data are available online, only results of analyses performed with the data.

There are not currently any costs associated with accessing TEAAS data. Effective use of the TEAAS application, however, requires some familiarity with the application.

Several published reports are available, such as the Traffic Records Crash Facts Book, based on TEAAS data. The Traffic Records Crash Facts Book is an annual report that contains various statistical data for crashes that have occurred in the state. A number of other resources, as well as a crash data request form, are located on the TESSB website.

Utility

The Federal Driver Privacy Protection Act (DPPA) and NC General Statutes restrict access to personal information in DMV (and therefore TEAAS) records to only those entities that qualify. State law further restricts disclosure of personal information.

Existing Links

TEAAS is linked continually to the GIS database to provide roadway information. This is the only permanent link for TEAAS. Other links may be made on an ad hoc basis.

Useful Resources

http://www.ncdot.org/ - North Carolina Department of Transportation

http://www.ncdot.org/dmv/ - North Carolina Division of Motor Vehicles (NC DMV)

https://dmvcrashweb.dot.state.nc.us/TEAAS/ - TEAAS

http://www.ncdot.org/doh/PRECONSTRUCT/traffic/ - Traffic Engineering and Safety Systems Branch (TESSB)

http://www.fhwa.dot.gov/ - Federal Highway Administration (FHWA)

http://itre.ncsu.edu/ - Institute for Transportation Research and Education (ITRE)

http://www.ncdot.org/dmv/other_services/recordsstatistics/CrashReports.html - Traffic Records Crash Facts Book

http://www.ncdot.org/doh/PRECONSTRUCT/traffic/safety/forms/crash_info.pdf - Crash Data Request Form

http://www.accessreports.com/statutes/DPPA1.htm - Federal Driver Privacy Protection Act

http://www.ncga.state.nc.us/gascripts/Statutes/Statutes.asp - North Carolina General Statutes

The following sources provide more information on the laws and statutes that cover the collection, storage, and/or use of crash data:
  •   Motor Vehicle Laws of North Carolina – Chapter 20 (Suggested references: 20-166.1; 20-26; 20-43, 20-43.1; 20-85; 20-52; 20-56; 20-50.3; 20-43.2; 20-43.4; 20-79.7)

  •   North Carolina Administrative Code 19A

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http://www.interplat.com/ecitation.htm
10/28/08

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Introduction

The Automated Criminal/Infractions System (ACIS) is a statewide, automated system maintained by the Administrative Office of the Courts (AOC). ACIS was established in 1982 to support Clerk of Superior Court Offices operations as well as to process district and superior court criminal cases.

The two components of ACIS are the criminal module and the infraction module.

The criminal module contains criminal case data that are either entered from case initiating documents (e.g. warrants for arrest, orders for arrest, bills of indictment) or received electronically from the AOC Magistrate System. The AOC Magistrate System is being transitioned over to the new NC Automated Warrant Repository (NCAWARE) system. NCAWARE is currently being piloted in one county.

The infraction module contains infraction case data that are either entered from case initiating documents (e.g., citations and magistrate orders) or received electronically from e-Citation®.

eCitation® is a joint initiative of the NC AOC and the NC State Highway Patrol (SHP). eCitation® is a system which automates the transmission of "non-arrestable" criminal and traffic citation data from a law enforcement officer's mobile data computer in the patrol car, through the NC Criminal Justice Information Network (CJIN) Mobile Data Network to ACIS and local law enforcement agency records management systems. Both the NC Uniform Citation and the NC Alcohol Law Enforcement (ALE) Citation are produced in electronic format by eCitation®, thus eliminating the need for paper citations.

During October 1999 through September 2001, a pilot project was conducted in Cumberland County to determine the feasibility of an electronic citation. Subsequently, several other counties were piloted. As of September 20, 2008, electronic citations had been implemented in all 100 county Clerk of Superior Court offices and over 6,550 officers in nearly 220 different agencies had been provided eCitation® access. Since law enforcement agencies are still being implemented, not all citations are issued via eCitation®. Whether citations are issued by eCitation® or on paper, they should all end up in ACIS.

Timeliness

ACIS and AOC's Magistrate System are able to communicate and share data through the AOC Local Interface (ALI). ALI allows real-time creation and updating of case records between the Magistrate System and ACIS. ACIS and NCAWARE are able to communicate and share data through MQseries also allowing real-time creation and updating of case records between the systems.

Data entry occurs on a case from initiation through disposition. However, when case data are viewed online, only the current status of the case is shown. Trial court level data are kept as cases move through district and superior court. If appealed, notations are made indicating the results of the appeal, although the trial and appellate data flows are not electronically linked.

Citations received via eCitation® are real-time. However, if a clerk must manually enter the data into ACIS, the timeliness of the data is dependent on how soon the clerk receives the citations from law enforcement. Typically, manually entered citation data are available within an average of two weeks, although timeliness can vary between agencies.

Infraction case data are purged every five years, but criminal case data are never purged.

Completeness

A data dictionary for ACIS is available upon request from the AOC. Data entered into ACIS must conform to standards, some of which are established by North Carolina General Statutes and Codes. The use of standard screens and fields for data entry into ACIS helps ensure that the standards are met. It is important to realize that ACIS does not provide case event history, but only a snapshot of the current status of the case.

Data for both criminal and infractions cases are stored in ACIS. eCitation® can only be used to process "non-arrestable" misdemeanors, including traffic offenses and infractions. No arrestable offences can be processed through eCitation®; arrestable offences are processed mainly through the Magistrate and NCAWARE systems.

The eCitation® software in an officer's patrol car interfaces with the Division of Motor Vehicles' (DMV) STARS and SADLS systems, enabling the officer to download driver's license or plate information into applicable citation fields; this helps to prevent the possibility of omission or mis-keying of demographic data.

Data extracted from ACIS may be transmitted via FTP, XML, or through an MQSeries interface.

Database Type

ACIS is an Information Management System (IMS) hierarchical database with some supporting VSAM files and DB2 tables. The language used is COBOLII.

Reliability

Since the AOC could be held legally responsible if an individual is falsely arrested, the data contained within ACIS are and must be reliable. Dispositions of court cases must be accurately recorded and then transmitted to other agencies, such as the DMV, the State Bureau of Investigation, the State Highway Patrol, and the Department of Corrections. Reliability of the data is critical because the public depends on ACIS data for criminal background checks, and the DMV uses the automated transmittal of ACIS data to assess their own adjudication criteria (i.e. insurance points).

Data transmitted via eCitation® are very reliable due to numerous edits that are built in to the software in the patrol car. Peer review and validation tools within ACIS help to ensure that manually entered data are entered correctly. Only the Clerk of Court has the ability to make edits to the data if any errors are found.

ACIS data are geo-coded by the name of the county in which the crime or infraction occurred. Although additional location information is often contained within case initiating documents, this location information is not stored in ACIS.

Interoperability

The key fields in ACIS are the defendant name, the name of the county where the offense took place, and the case number. Data inquiry access is available to court and law enforcement officials. In addition, ACIS data are shared through external interfaces, requested extracts, and electronic inquiries through the Department of Justice. Existing interfaces with other state agencies include:

- Division of Motor Vehicles (DMV)
- State Bureau of Investigation (SBI)
- State Highway Patrol (SHP)
- Department of Correction (DOC)
- State Board of Elections

Accessibility

ACIS is available 24 hours a day, except for scheduled maintenance. The public may access ACIS data for a particular county at computer terminals located within the county courthouses. No formal training is required to use ACIS; however, user manuals are located at the terminals and are also available upon request.

ACIS data may also be obtained from the Clerk of Court, or through use of background check websites. A number of private companies have vendor agreements with the AOC to buy and resell the data. The Useful Resources section of this chapter provides a link to the NC Courts webpage that lists many of these companies and their websites. The only fees associated with obtaining the data are those assessed by the individual background check company; in addition, there is a nominal fee for requests to receive a certified copy of case data from the clerk. Each Clerk of Superior Court is the official record keeper of criminal and infraction data. The Chief Information Officer of the AOC is responsible the application and storage of the data.

Utility

ACIS data pertaining to unserved warrants are confidential and are not available to persons without proper authorization. The remainder of the data are available to the public. ACIS data pertaining to unserved warrants are confidential and are not available to persons without proper authorization. The remainder of the data are available to the public.

Future Improvements

Suggestions for the next improvements to the ACIS database include expansion of stored data to include case history information, rather than just a snapshot of the existing status of the case.

Useful Resources

http://www.nccourts.org/ - North Carolina Administrative Office of the Courts

http://www.nccourts.org/Citizens/GoToCourt/Default.asp?topic=1 – Criminal Background Checks

http://www.ncdot.org/dmv/ - North Carolina Division of Motor Vehicles

http://www.ncsbi.gov/ - State Bureau of Investigations

http://www.nccrimecontrol.org – North Carolina State Highway Patrol

http://www.doc.state.nc.us/ - North Carolina Department of Correction

http://www.sboe.state.nc.us/ - North Carolina State Board of Elections

A number of general statutes cover the collection, storage, and/or use of the ACIS data. Statues from the following chapters apply:

- NC GS Chapter 7
- NC GS Chapter 20
- NC GS Chapter 132

Chapter 7

"Data are collected from all safety inspections and compliance reviews performed in North Carolina and all reportable CMV crashes that occur on North Carolina highways."

Introduction

SAFETYNET is a computer system utilized by state law enforcement agencies and the Federal Motor Carrier Safety Administration (FMCSA) for the collection and management of commercial motor vehicle (CMV) data. It was established in the early 1980's and contains records for the previous three years. Data older than three years are archived. SAFETYNET is a menu-driven graphical user interface (GUI) program that runs in the Microsoft Windows environment. Data are collected from all safety inspections and compliance reviews performed in North Carolina and all reportable CMV crashes that occur on North Carolina highways.

The NC State Highway Patrol (SHP) Motor Carrier Enforcement Troopers collect CMV inspection data utilizing FuelTacs, a roadside inspection application installed on their in-vehicle laptops. FuelTacs is a custom-designed state system that facilitates electronic collection and submission of CMV inspection data in the field. After the trooper enters data into FuelTacs, the data are imported into SAFETYNET.

The Inspection Selection System (ISS) is the primary tool used on the roadside to screen motor carrier vehicles and determine the usefulness of conducting an inspection. ISS returns the carrier "snapshot," which includes critical safety performance indicators. Inspection data are also collected following any crash involving a CMV, in a post crash inspection report. There are six levels of CMV inspection:

- Level I — Full Inspection of Vehicle and Driver
- Level II — Walk Around of the Vehicle
- Level III — Driver Only
- Level IV — Special Studies (Research)
- Level V — Full Inspection of Vehicle
- Level VI — Radiological Inspection

From SAFETYNET, data are uploaded to the Motor Carrier Management Information System (MCMIS). MCMIS is the FMCSA repository for motor carrier registration, roadside inspection, crash compliance review, and other motor carrier enforcement information.

The NC Division of Motor Vehicles (DMV) maintains data for all reportable crashes in the state, including CMV crashes. CMV crash data are collected on the DMV-349 crash report form or through the electronic data collection system TRCS and stored in the DMV crash database. The DMV is responsible for forwarding reportable CMV crash data to the SHP, where the data are imported into SAFETYNET and then uploaded to MCMIS. More information pertaining to CMV crash reporting can be found in the DMV Crash Database chapter.

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Timeliness

The NC SHP reports that CMV inspection data are typically received from FuelTacs and imported into SAFETYNET twice a day. It is then usually about a week until the data are available in MCMIS. FMCSA requires that each inspection record be uploaded to MCMIS within 21 days of the inspection. Each state is given a timeliness rating based on the number of inspection records that meet submission requirements over a 12-month period. North Carolina's timeliness rating is "Good," which indicates that 85% or more of inspection records are reported to FMCSA within 21 days. MCMIS inspection data are archived after three years.

Completeness

A SAFETYNET data dictionary is available upon request from the NC SHP Motor Carrier Enforcement Administration Section. It is updated as needed when changes are made to the dataset. Data requests are usually made for research or collision reconstruction purposes. Once a request is approved, only non-identifiable data are provided to the requestor. The data are typically provided in a spreadsheet. SAFETYNET data are considered to be very complete.

Database Type

The data are in XML format.

Reliability

SAFETYNET data are considered to be very reliable. Auto checks and edits, as well as manual review of entered data, help to ensure the reliability of the data. Data are not typically edited unless an error is identified. One way in which errors are spotted and corrected is through a function on the FMCSA web site called DataQs. Through DataQs the public has the ability to challenge data, such as incorrect carrier identification information, or request data.

Interoperability

SAFETYNET data are routinely transferred to the MCMIS for analysis by FMCSA and are used to help determine a motor carrier's safety rating.

Key fields in SAFETYNET include the driver name, carrier name, county name, and vehicle DOT number.

SAFETYNET data may be geo-coded using several different linear referencing systems, such as highway mileposts and county codes.

Accessibility

Data requests may be made by CMV carriers through DataQs. Other requests for data are often made for research or crash reconstruction purposes. In addition to DataQs, requests for data may also be made through written request to the State Highway Patrol or the FMCSA. At this time, there are no costs associated with accessing or requesting data. No formal training is required to utilize SAFETYNET data. A help menu is available in SAFETYNET to guide novice data users through the system.

Utility

SAFETYNET data that are provided for research or other general purposes do not contain fields that can identify individual drivers, vehicles, or companies..

Existing Links

SAFETYNET is currently linked to MCMIS, a source of FMCSA inspection, crash, compliance review, safety audit, and registration data.

Useful Resources

http://www.fmcsa.dot.gov/ - FMCSA

http://www.nccrimecontrol.org/ - North Carolina State Highway Patrol

http://www.ncdot.org/dmv/ - NC Division of Motor Vehicles (DMV)

Chapter 8

"Data are required to be entered for all patients statewide who are evaluated, treated, or transported by an EMS provider."

Introduction

PreMIS is the Prehospital Medical Information System for North Carolina. The NC Office of Emergency Medical Services (OEMS) is the agency responsible for the database, and it is maintained by the EMS Performance Improvement Center (EMSPIC). Funding for the development of PreMIS was provided in 1999 through a grant from the North Carolina Department of Transportation (NCDOT) and the Governor's Highway Safety Program. The main objective of PreMIS is to provide a method for each emergency medical service (EMS) provider in North Carolina to enter patient care data into a central database.

There are two methods by which data may be electronically submitted into PreMIS. If a commercial EMS software product is in place within the EMS agency, data may be electronically submitted into PreMIS using the National EMS Information System (NEMSIS) file format. EMS agencies can also enter data directly into PreMIS using a web-browser based interface at no cost.

Other components of PreMIS include hospital patient outcome data from the Trauma Registry (see its Chapter elsewhere in this document for more details), medical device data, billing information, technician and provider tracking, and an extensive real time quality management reporting system.

The EMS Performance Improvement Toolkit project is also built on top of the PreMIS system. The EMS Toolkits allow EMS systems to critically evaluate their EMS service delivery, personnel performance, and patient care across several topics. EMS Toolkits have been developed to allow EMS systems to benchmark themselves against similar sized EMS systems and the state. EMS Toolkits topics include EMS System Response Times, Acute Trauma Care, Cardiac Arrest Care, Acute Cardiac Care, Acute Stroke Care, and Acute Pediatric Care.

Through standardization of the data collection and documentation process, PreMIS facilitates improved patient tracking, involvement in public health and injury prevention initiatives, EMS research, and system comparison across agencies.

Timeliness

Patient data are typically available within 24 hours. Data are not purged, nor are they typically edited, except for cases in which an error or inconsistency is discovered. Data over three years old is archived but available for use through a different interface.

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http://www.emspic.org/

Completeness

A data dictionary for PreMIS is available online within the EMS section of the North Carolina College of Emergency Physicians webpage (http://www.nccep.org/). The North Carolina EMS dataset is completely based on the national standard, "NHTS Uniform PreHospital Dataset Version 2.2.1". The data dictionary is updated as changes are made, or about every three years; the most recent edition of the PreMIS data dictionary was released in 2005. More documentation of PreMIS and the North Carolina EMS Data System can be found on the North Carolina EMS Data System webpage, located within the NC OEMS website.

PreMIS is designed around all of the current data standards which have implications to prehospital care. The PreMIS dataset is configured from a combination of the following datasets:

- National Highway Traffic Safety (NHTSA) Prehospital Dataset;
- Emergency Department Dataset from the Center for Disease Control;
- Vehicle and Fatal Accident Reporting Systems from NHTSA;
- North Carolina Medical Examiner's Database;
- NHTSA Crash Outcomes Data Project;
- North Carolina Trauma Registry; and
- Other injury surveillance and EMS specialty datasets.

It is not required that EMS providers document all data points in the dataset for each EMS event, but documentation of all applicable data elements for that event is required. PreMIS is considered an electronic medical record with over 230 possible data elements for each EMS event.

Data are required to be entered for all patients statewide who are evaluated, treated, or transported by an EMS provider.

Although PreMIS contains data dating back to 2002, the data quality is highest and completeness is greatest for the calendar years 2006 forward.

Database Type

PreMIS data are stored in an Oracle database.

Reliability

Since data contained within PreMIS constitute medical records, the data are typically quite reliable and are not edited except for cases in which an error is found. Several quality control measures are in place to ensure that the data are entered correctly and that data collected from EMS providers are consistent. In addition to the validation tools incorporated into PreMIS, as well as peer review of collected data, PreMIS has an extensive number of preconfigured queries that can be adjusted by each EMS system. The queries run in real time and reports can be generated based on anonymous comparisons between systems of similar size and demographics. The reports do not identify the system, but do allow systems to benchmark themselves against others. No patient identifiable data are exchanged in the comparison reports.

Interoperability

Several fields in PreMIS may be used as key fields. The data may be used in a number of different contexts, and therefore the key fields vary depending on who is using the data and how they use it.

PreMIS has the ability to collect GPS coordinates entered by EMS providers; however, most EMS providers across the state either do not have the capability to collect GPS coordinates or do not enter those data into PreMIS. Typically, event location information is entered in the form of an address or an intersection.

PreMIS data are shared with a number of different systems maintained at both the state and federal levels. Data from Pre-MIS are shared daily with The North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT), which provides statewide early event detection and timely public health surveillance to public health officials and hospital users. In addition, PreMIS data are sent to the National EMS Information System (NEMSIS), on a quarterly basis. NEMSIS is the national repository that is used to store EMS data from every state in the nation. PreMIS data are also actively linked with the North Carolina Trauma Registry.

Accessibility

PreMIS query capabilities are available only to technicians and administrators with the proper access authority. For example, a local EMS can only access its own data in PreMIS. All data are kept confidential and any patient record viewed has an audit trail documenting when and who accessed the record.

When data are transmitted internally, to a local EMS provider for example, the data are typically transmitted securely through a web browser using the internet. Data requests made by outside entities, such as a university or an attorney's office, need to be reviewed and approved by the OEMS Institutional Review Board (IRB) before data are transmitted. At this time, there are no costs associated with requesting or accessing the data.

Utility

Any research conducted using PreMIS data is subject to very strict policies, protocols, and procedures to assure patient and system confidentiality.

Existing Links

There is currently a link between PreMIS and the NC Trauma Registry. Links to the NC Division of Motor Vehicles (DMV) Traffic Records Communication System (TRCS) and the State Stroke Registry are planned by the end of 2008. A link to NC DETECT is also in the works and should be completed within the next couple of years.

Useful Resources

NC General Statute 143-518 covers the storage and use of PreMIS data as it pertains to the confidentiality of patient information.

http://www.emspic.org/?q=node/17 - Prehospital Medical Information System (PreMIS)

http://www.ncdot.org/programs/GHSP/ - Governor's Highway Safety Program (GHSP)

http://www.nccep.org/content/ems/standards/RequiredDataElements.pdf - PreMIS Data Dictionary

http://www.nccep.org/ - North Carolina College of Emergency Physicians

http://www.ncems.org/ncemsdatasystem.html - North Carolina EMS Data System

https://www.ncdetect.org/ - North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT)

http://www.nemsis.org/ - National EMS Information System (NEMSIS)

http://www.ncems.org/trauma/trauma_registry.htm - North Carolina Trauma Registry

http://www.ncdot.org/dmv/ - North Carolina Division of Motor Vehicles (DMV)

https://dmvcrashweb.dot.state.nc.us/TRCS/ - NC DMV Traffic Records Communication System (TRCS)

North Carolina Office of Emergency Medical Services - Trauma Registry

Chapter 9

According to the American Association for the Surgery of Trauma, trauma is the leading cause of death for individuals up to the age of 45 years.

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http://www.ncems.org/trauma/trauma_registry.htm

Introduction

The North Carolina Office of Emergency Medical Services (OEMS) was formed following implementation of the North Carolina Emergency Medical Services Act of 1973. The OEMS has the statutory responsibility to maintain a statewide trauma system, which includes the Trauma Registry. Since late 1987, the Trauma Registry has collected data on trauma patients treated at North Carolina hospitals.

Trauma centers are given either a Level I, Level II, or Level III designation based on criteria set forth by the NC OEMS. The specific designation criteria can be found on the NC OEMS website. Refer to Table 1 for a breakdown of the NC trauma centers by designation as of August 2008.

Table 1
North Carolina Trauma Centers

NC Trauma Centers	Location	Designation
UNC Health Care System	Chapel Hill	I
Duke University Medical Center	Durham	I
Wake Forest University Baptist Medical Center	Winston-Salem	I
University Health Systems of Eastern North Carolina	Greenville	I
Carolinas Medical Center	Charlotte	I
WakeMed	Raleigh	I
New Hanover Health System	Wilmington	II
Mission St. Joseph's Health System	Asheville	II
Moses Cone Health System	Greensboro	II
North East Medical Center	Concord	III
Cleveland Regional Medical Center	Shelby	III
High Point Regional Health System	High Point	III

Originally when the Registry was created, North Carolina used a customized software package as a means to collect data from participating hospitals. However, in 1994, the Registry migrated to the NTRACS® software. Currently, 15 hospitals (including all 12 trauma centers listed in Table 1) use the NTRACS® software, which enables users to enter over 250 data points on each trauma patient.

In addition, the North Carolina Office of Emergency Medical Services, in cooperation with the State Trauma Advisory Committee, has defined a subset of the Trauma Registry data elements that can be collected and voluntarily submitted by non-trauma center

community hospitals. The OEMS began to offer this to non-trauma center community hospitals in 2003, and 17 hospitals currently utilize the mechanism to enter approximately 35 key data points on trauma patients.

The main objectives of the Trauma Registry include the following:

- Facilitation of injury prevention activities;
- Oversight and improvement of quality of care;
- Identification of resources to meet system needs;
- Facilitation of research; and
- Collaboration with agencies sharing similar interests.

Timeliness

Data on trauma patients are typically entered in two stages. The first stage of data entry takes place when the patient is admitted, and includes entry of basic patient information. The State then requires that complete data on all trauma patients be entered into NTRACS® within 90 days of the date of discharge, date of transfer, or date of death.

The data contained within the Trauma Registry are not purged, nor are they updated unless there is found to be an error.

Completeness

A data dictionary for the Trauma Registry is available online at the NC OEMS web site, and is updated as changes are made to the Registry dataset. Data contained within the Registry is protected by North Carolina law (not subject to the Freedom of Information Act) and secured using the HIPAA security standards for identifiable patient information.   In addition to the fields contained in the data dictionary, each participating facility also has the ability to develop and maintain custom data fields.

The Trauma Registry consists of data collected from approximately 32 of the 122 hospitals in North Carolina, and new hospitals are being added on a voluntary basis. Data are required to be entered for patients who are admitted to the hospital and have an International Statistical Classification of Diseases and Related Health Problems (ICD) code between 800 and 959.9. ICD codes are used to classify diseases and a wide variety of signs, symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or disease. Every health condition can be assigned to a unique category and given a code, up to six characters long. ICD codes between 800 and 959.9 are used for trauma related injuries.

Database Type

Trauma Registry data are stored in an Oracle database.

Reliability

Several quality control measures are currently in place to ensure reliability of data within the Trauma Registry. The NTRACS® software is equipped with a validation tool that minimizes errors that may occur during entry of the data. In addition, approximately 10%-15% of a hospital's trauma reports must go through a peer review process before being submitted to help identify errors that may not have been caught by the software. The reliability of a particular facility's data may also be determined through comparison of that facility's reports to the overall data collected from participating hospitals statewide.

Trauma Registry data are geo-coded by the zip code in which the collision occurred, and do not necessarily include additional geographic information on a collision such as address, milepost, etc.

Interoperability

Determination of key fields in the Trauma Registry is dependant upon who is using the data and for what purpose. Patient name is an obviously important field for matching these data to other databases. The ICD code field is also almost always important.

Currently, the Trauma Registry is linked actively with the North Carolina PreHospital Medical Information System (PreMIS). See the chapter on PreMIS elsewhere in this document for more details on that database. This linkage allows the trauma center to identify the EMS record for the patient and import the required EMS data elements from PreMIS into the Trauma Registry software. In return the Trauma Registry record is then linked with the EMS record in PreMIS to provide outcome information to the EMS agency that transported the patient to the trauma center. This active linkage was implemented January 1, 2008.

Data from the Trauma Registry is protected by NC law and is not able to be released under the Freedom of Information Act. Data can be released in an aggregate fashion which protects individual patients and trauma centers.

Trauma Registry data may also be voluntarily submitted to the National Trauma Data Bank (NTDB) by the Trauma Centers through the NTRAX software.

Accessibility

The NC OEMS is responsible for maintenance of the Trauma Registry. Trauma Registry data are not available online. Data requests are most often made by universities, residents, or medical professionals for use in published papers or research projects. To obtain data, a formal request needs to be submitted to the OEMS. A process for data release must be followed including the approval by the OEMS Institutional Review Board (IRB). Once a request is approved, data may be provided electronically via several file formats. Training on the NTRACS® software is not necessary to utilize the requested data; however, familiarity with the data dictionary may be helpful. There are not currently any costs associated with requesting data.

Utility

Any research conducted using NC Trauma Registry data is subject to very strict policies, protocols, and procedures to assure patient and system confidentiality.

Existing Links

The NC Trauma Registry is currently linked to the National Trauma Data Bank (NTDB) and PreMIS.

Future Improvements

The NC OEMS is implementing a web-based Trauma Registry reporting tool that will allow a more extensive reporting system for trauma centers. This will also provide some benchmarking capabilities among the trauma centers and improve overall communication and data use. This same tool will also allow reports describing the NC trauma system to be made available for general public use. This will be fully functional by the end of 2008.

Useful Resources

http://www.ncems.org/ - North Carolina Office of Emergency Medical Services (OEMS)

http://www.dicorp.com/ - NTRACS®

http://www.ncems.org/pdf/Trauma/NCTR_Data_Dictionary_5-14-2007.pdf - Trauma Registry Data Dictionary

http://www.emspic.org/?q=node/17 - Prehospital Medical Information System (PreMIS)

https://www.ntdbdatacenter.com/ - National Trauma Data Bank (NTDB)

Chapter 10

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Introduction

The main objectives of the Information and Mapping (IMG) Unit are to provide quality mapping of the existing state maintained system of highways as well as to produce computer generated images of proposed NCDOT projects. This information is used in the planning, funding, construction, and maintenance of transportation facilities throughout the state, helping to provide an efficient and cost effective state transportation system.

The Information and Mapping Unit is divided into three major sections:

• Road Inventory Information Section – generates and maintains database of highway data using various sources of information such as highway construction plans and reports from NCDOT division and district staff.

• Product Development Section – produces cartographic products such as the State Transportation Map, the Coastal Boating Guide, County Maintenance Maps, and over 20 other custom map products that are built to customer requirements.

• Product Distribution Section – provides customer support and ensures distribution and delivery of products created by the Information and Mapping Unit.

Note that the IMG Unit is a relatively new one at the NCDOT. Its products are spatially-oriented. Many of those products rely on the geographical framework and analyses provided by the NCDOT GIS Unit. One of the core functions of the GIS Unit is to maintain the linear referencing system for the NC transportation network. A description of the NCDOT GIS Unit, as related to the purposes of this Guide, is included as an Appendix to this chapter.

Timeliness

The data and products maintained and distributed by the Information and Mapping Unit are updated regularly to provide current and useful information to customers. Some products are updated daily, like the online county maps (in TIF format), while others, such as the State Transportation Map, are updated annually. In addition, a large portion of data is updated at varying intervals as needed to provide reliable information. Most of the products distributed by the Information and Mapping Unit indicate the date(s) for which the data are current.

Data maintained by the Information and Mapping Unit are not periodically purged.

Completeness

Products developed by the Information and Mapping Unit are provided in hardcopy, digital, and/or image formats. Listings of and weblinks to the available products can be found on the Product Distribution page of the IMG website. If a product is available in multiple data formats, users are given a choice which format in which to download the data. The following products are currently available through the Product Distribution webpage:

Map Products
> State Travel Map
> County Map Images
> Bridge Location Maps
> Straightline Diagrams
> Traffic Volume (AADT) Maps
> Order Paper Maps
> NC Coastal Boating Guide
> Statewide Maps
> NC Truck Network Map
> NC Moving Ahead! Maps
> NC County Crash Profile Overview Maps

CAD Data
> County Map Data
> Microstation Seedfiles

Reports
> HPMS
> Highway & Road Mileage Reports
> Road Statistics
> Universe File Structure

Tools
> Image Map of Counties
> Secondary Roads Database (SR# Lookup)

Database Type

Many of the data files maintained by the IMG Unit are in geographic information system (GIS) or computer-aided design (CAD) formats. GIS databases are typically, at the core, flat files maintained in a database management system and may be downloaded in a wide variety of useful formats.

Reliability

The data maintained by the IMG Unit and its products are typically quite reliable, but of course the reliability varies by product. The products and services maintained by the unit are as accurate as possible in order to be of value in the planning, funding, construction, and maintenance of state transportation facilities. The Road Inventory Information Section is responsible for maintaining the data and making edits as changes are made and new projects are developed.

Interoperability

The IMG Unit maintains a large quantity of data, and therefore there are really numerous key fields. Several examples of key fields include county name, road name/secondary road (SR) number, bridge number, Transportation Improvement Program (TIP) number, NCDOT Division/District, and latitude/longitude coordinates.

The products and services offered by the IMG Unit are frequently utilized by other state and local systems, such as the Center for Geographic Information and Analysis and the North Carolina Department of Environment and Natural Resources (DENR). In many cases, other systems provide links to the IMG or GIS Unit websites and/or the products that they offer.

Accessibility

The products and services offered by the IMG Unit are accessible to the general public by request or through the IMG Unit website. Many of the products are available at no cost and can be downloaded directly from the website. To obtain paper maps, users must complete the online map order form located on the IMG website and send payment to the IMG Unit. The unit cost for each map or book is indicated on the order form. No training is typically needed or required to obtain or use the data.

Several published reports are currently available, including the annual Highway and Road Mileage Report which summarizes road mileage data and categorizes it in several ways (e.g. primary or secondary route, road surface type, surface width, etc.). Published reports can be found through on the IMG Unit website. A listing of useful websites is provided at the end of this chapter in the Useful Resources section.

Utility

There are not any restrictions on the use of the data. However, there is a disclaimer on the IMG Unit website that should be read prior to use of the data.

Useful Resources

North Carolina Department of Transportation

> http://www.ncdot.org/ - NCDOT Main Page
> http://www.ncdot.org/it/ - Information Technology
> http://www.ncdot.org/planning/ - Planning and Environment
> http://www.ncdot.org/doh/preconstruct/tpb/ - Transportation Planning Branch
> http://www.ncdot.org/doh/preconstruct/tpb/traffic_survey/ - Traffic Survey
> http://www.ncdot.org/it/img/ - IMG
> http://www.ncdot.org/it/gis/ - GIS

NC Agencies & Local Organizations

> http://www.ncgov.com/ - North Carolina, a better place... (NCGov)
> http://www.cgia.state.nc.us/ - CGIA Center for Geographic Information & Analysis
> http://www.enr.state.nc.us/ - DENR Department of Environment and Natural Resources
> http://www.ncgs.state.nc.us/ - NC Geodetic Survey
> http://www.geology.enr.state.nc.us/ - NC Geological Survey
> http://ncinfo.iog.unc.edu/ - School of Government
> http://itre.ncsu.edu/ - ITRE Institute for Transportation Research & Education
> http://www.ceo.ncsu.edu/ - NCSU Center for Earth Observation

Federal Agencies and National Organizations

> http://www.usgs.gov/ - USGS United States Geological Survey
> http://edc.usgs.gov/ - USGS EROS Earth Resources Observation and Science
> http://www.fgdc.gov/ - FGDC Federal Geographic Data Committee
> http://www.nima.mil/ - NGA National Geospatial-Intelligence Agency
> http://www.fhwa.dot.gov/ - FHWA Federal Highway Administration
> http://www.bts.gov/index.cfm - BTS Bureau of Transportation Statistics
> http://www.fema.gov/ - FEMA Federal Emergency Management Agency
> http://www.epa.gov/ - EPA Environmental Protection Agency
> http://www.fws.gov/nwi/ - Fish & Wildlife Service (National Wetlands Inventory)
> http://www.blm.gov/nhp/index.htm - BLM Bureau of Land Management
> http://www.nps.gov/ - National Park Service
> http://www.census.gov/ - Census Bureau
> http://www.noaa.gov/ - NOAA National Oceanic and Atmospheric Administration
> http://www.transportation.org/ - AASHTO American Association of State Highway and Transportation Officials

Appendix – NCDOT Geographic Information Systems (GIS)

Introduction

The main objective of the NCDOT Geographic Information Systems (GIS) Unit is to provide quality geographic information and services supporting the business processes of the NCDOT, as well as for the transportation related functions of NC state agencies, local governments, and other planning organizations. Since many safety data are spatially-oriented, geographical information systems have great potential to aid in their collection, management, analysis, and display. The NCDOT GIS Unit is obviously a key component of the safety data system in North Carolina.

One of the critical core datasets maintained by the NCDOT GIS Unit is the Linear Reference System (LRS). The LRS identifies any element with a spatial component by a measure along a linear element. The LRS can be used to reference events for any network of linear features, such as roads, railways, rivers, pipelines, electric lines, telephone lines, water networks, and sewer networks. An event is defined in the LRS by a route ID and a measure. A route is a path on the network. Events can be either points or lines (segments). The current LRS dataset was established in 2006.

Another dataset important for safety purposes maintained by the NCDOT GIS Unit is the Integrated State Road Network (ISRN). The ISRN is a compilation of all of the centerline road data statewide. It differs from the LRS in that it is geocoded and routable. For example, the ISRN contains the necessary attributes to match addresses or locations based on a variety of geocode references. The ISRN also contains data on other attributes of each link in the network, such as speed limit and type of roadway. The current ISRN dataset was established in 2006.

Timeliness

GIS data are constantly evolving. Field data are received on a daily basis from NCDOT Division Offices located throughout the state. The data may be manually entered and older datasets may be converted to conform to the new system.

LRS route information is updated daily and published monthly. The ISRN data are typically updated twice a year; however, ISRN updates are currently on hold due to other priority considerations by NCDOT. Data are not periodically purged.

Completeness

ISRN metadata are available online on the NCDOT GIS Unit website. LRS metadata are also available online. These resources are updated quarterly or semiannually.

The ISRN is considered to be the most complete database for the state roadway network and the LRS is considered to be the most complete network. The LRS does not include local roads, while the ISRN does.

Other products of the NCDOT GIS Unit are included on its website and include:
- GIS Data Layers
- Contour & Elevation Data
- FEMA Flood Data
- 1993 Aerial Photography
- USGS Topographic Maps
- 1998 Color-IR Images
- Digital Bicycle Maps & Route Information

Database Type

GIS Unit data may be downloaded in any format supported by the Environmental Systems Research Institute, Inc. (ESRI) software package, including shape files.

Reliability

NCDOT GIS data are considered to be quite reliable. Many non-transportation agencies and companies rely upon GIS data from the NCDOT in their applications, for example.

LIDAR is a remote sensing system in which data are collected with aircraft-mounted lasers capable of recording elevation measurements at a rate of 2,000 to 5,000 pulses per second. LIDAR data have a vertical precision of approximately 25 cm, or about 10 in. LIDAR data are beginning to become available for some areas and variables in NC.

GIS data are geo-coded by county milepost, route/road name, and GPS coordinates. Within the NCDOT GIS Unit, the Data Conversion Group responsible for updating the LRS and several other datasets. The group works with other government agencies to improve data quality in order to help them better maintain their respective datasets. The Spatial Data Management Group is another group within the GIS Unit that is responsible for providing quality assurance and access to the datasets.

Interoperability

Key GIS fields include the route and milepost. NCDOT GIS data are routinely shared and linked with other state agencies, local governments, and planning organizations.

Accessibility

The data that the GIS Unit maintains are primarily intended for internal NCDOT use. However, the research community, outside groups and agencies, and general public are able to obtain the data. All requests for data must go through the Spatial Data Management Group. There are not currently any costs or training associated with obtaining data. In order to use spatial data, however, some training may be necessary to become familiar with the GIS.

Utility

There are no restrictions on the use of NCDOT GIS data. However, there is a disclaimer on the GIS Unit website that should be read prior to use of the data.

Existing Links

There are no existing links to other traffic records systems.

Chapter 11

"The hope is that people will be inspired to tap these data resources to a greater extent and make inroads into the terrible toll that traffic crashes takes in NC."

Summary

This Guidebook has attempted to provide information on each of the major data systems in North Carolina that pertain to safety and traffic crashes. The objectives were to provide professionals and interested non-professionals with a look at the contents of the databases and the contacts for the databases. The hope is that people will be inspired to tap these data resources to a greater extent and make inroads into the terrible toll that traffic crashes takes in NC.

Wide Range of Data Available

Most of the databases covered in this guidebook pertained to crashes. Figure 1 provides some perspective by illustrating the flow of data through the various systems following a crash.
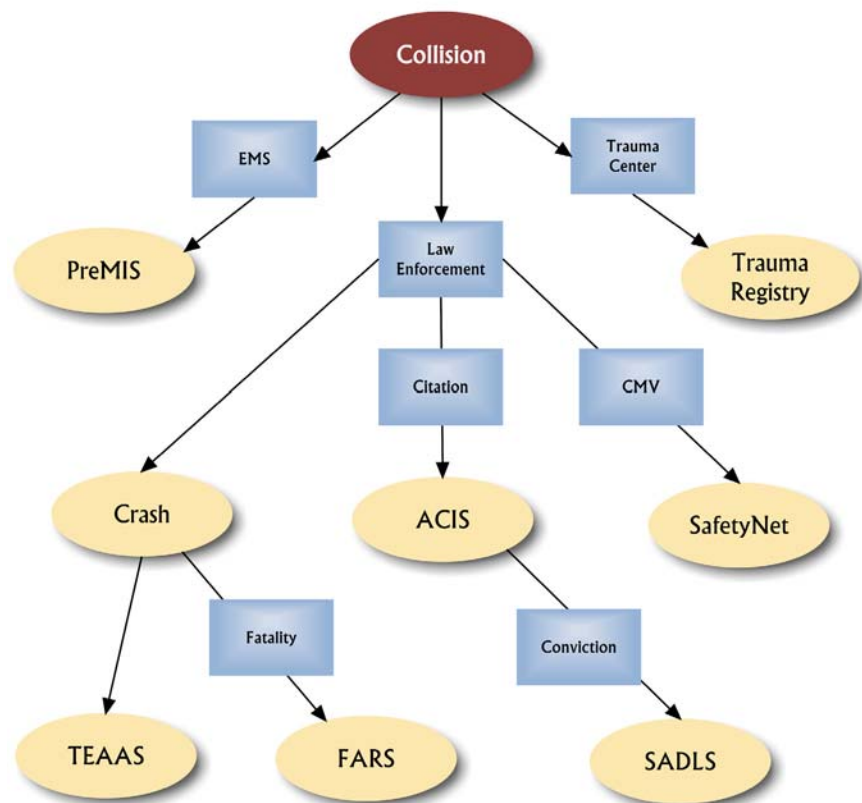

Figure 1: Existing Flow of Data

As shown in Figure 1, law enforcement is typically the first to collect crash data immediately following the incident. In addition, if any injuries or trauma occurred as a result of the crash, the collection of those data begins very soon following the incident as well, in PreMIS and/or the Trauma Registry. Law enforcement is responsible for issuance of citations to the Administrative Office of the Courts, if any are warranted. Citation data are captured and stored in ACIS. If a conviction is made, the conviction data are sent to the NC Division of Motor Vehicles (DMV) to be entered into the State Automated Driver License System (SADLS).

Law enforcement is also responsible for submission of crash data to the DMV. These data are recorded on the DMV-349 form, are submitted either manually or electronically using TRCS, and end up in the Crash database. Data for all reported crashes are also stored and processed in the Traffic Engineering Accident Analysis System (TEAAS) maintained by the NCDOT. If a crash results in a fatality within 30 days of the crash, that data are sent by the DMV to be included in FARS. Data on commercial motor vehicle crashes are sent to SafetyNet.

Besides the crash-related data shown in Figure 1, this guidebook covered two other database systems that are integral to safety analyses. STARS is the database of vehicle registrations while the databases of the NCDOT IMG and GIS Units provide road-way information. Table 2 summarizes all of the major databases covered in this Guidebook and the aspects of safety that they cover. Considering all of the databases covered by this Guidebook, it is clear that North Carolina has a large and comprehensive safety data system.

Table 2: Summary of Areas Covered by Major Databases

DATABASE	DRIVER	ROADWAY	VEHICLE
Crash	√	√	√
SADLS	√		
STARS			√
TEAAS	√	√	√
ACIS	√	√	
SafetyNet	√	√	√
PreMIS	√	√	
Trauma Registry	√		
IMG and GIS		√	

Many Links Possible

After reviewing all of the previous chapters of this Guidebook, it should be clear that analysts could create many links between the databases to help solve complex safety problems. One of the primary focuses of analysis, and one of the main ways that some of the databases could be linked, is by driver name. Figure 2 shows generally how data from many databases could be linked, via driver name. Indeed, Figure 2 includes all of the major databases covered in this guidebook except the spatial databases of the NCDOT IMG and GIS Units.
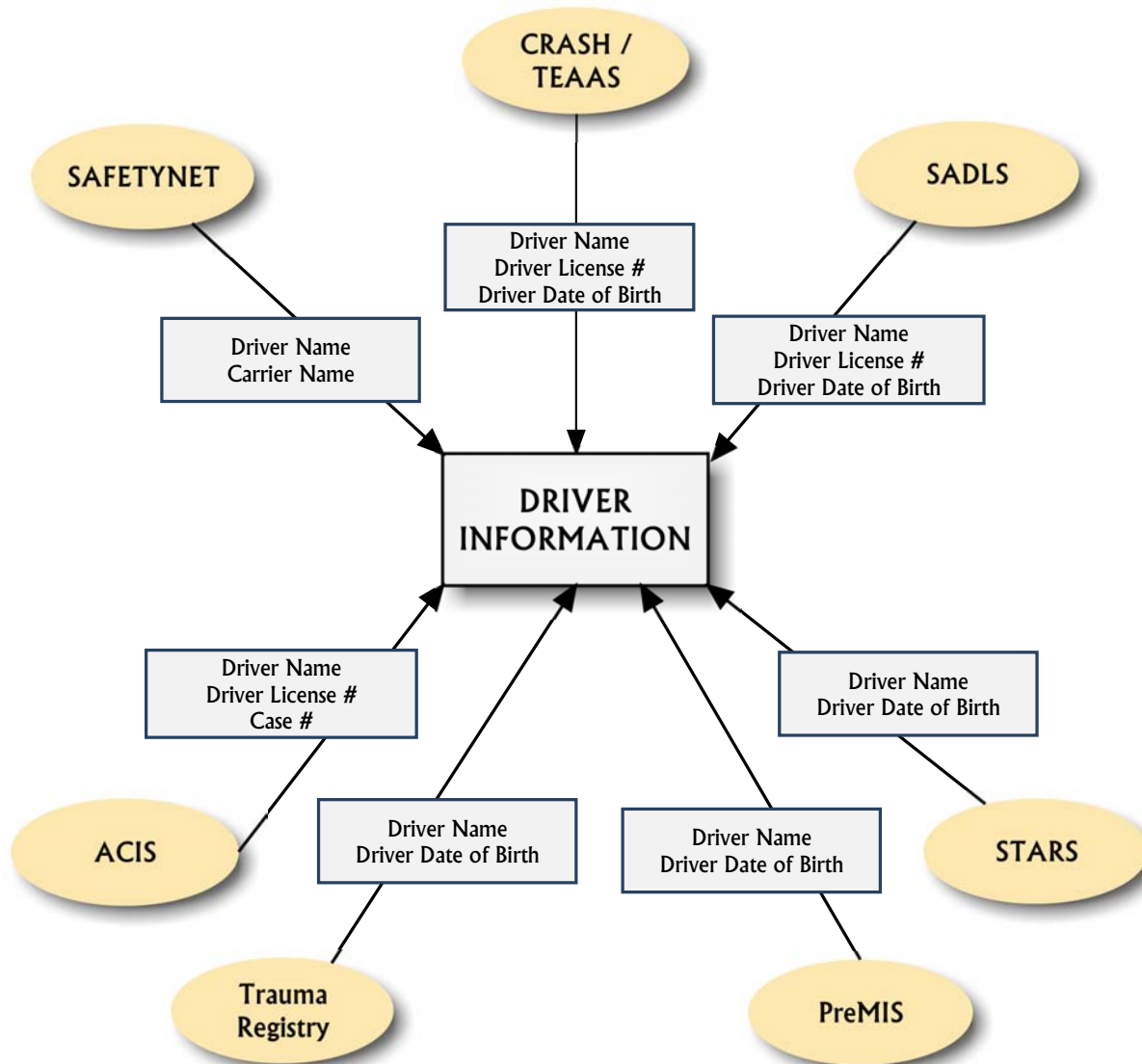

Figure 2: Driver Information

Many safety analysts will be interested in particular locations on the roadway system. Fortunately, many links between safety databases are possible to aid those analyses. Figure 3 shows the possible links between databases covered in this guidebook based on location. Links may be possible based on county, city, roadway name, route number, milepost information, address, and perhaps other key fields.
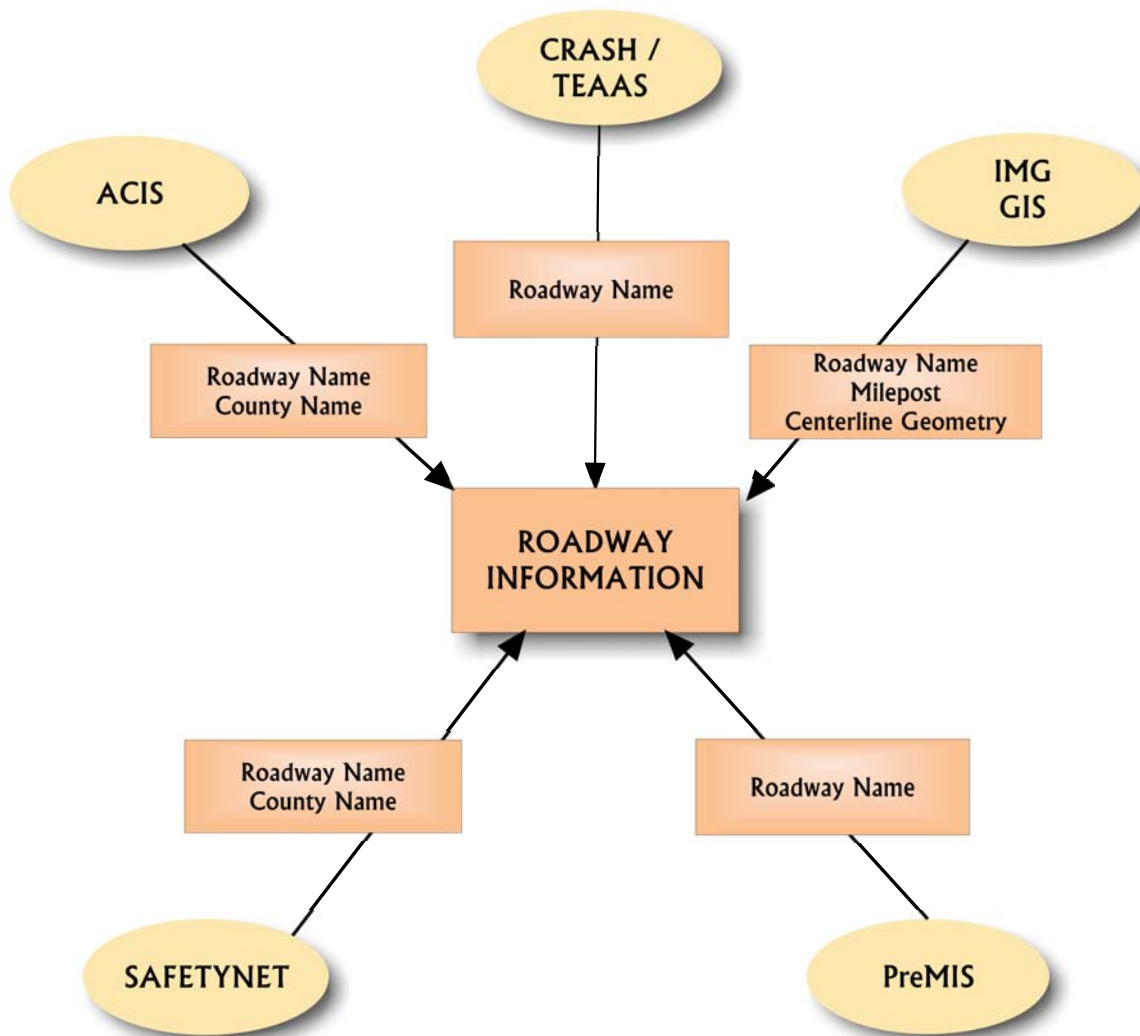

Figure 3: Roadway Information

Links between databases are also possible for analysts interested in vehicles, as Figure 4 shows. Vehicle information is stored in fewer places than driver and roadway information. Key fields could include vehicle make, vehicle model, license plate number, and DOT number for commercial motor vehicles.
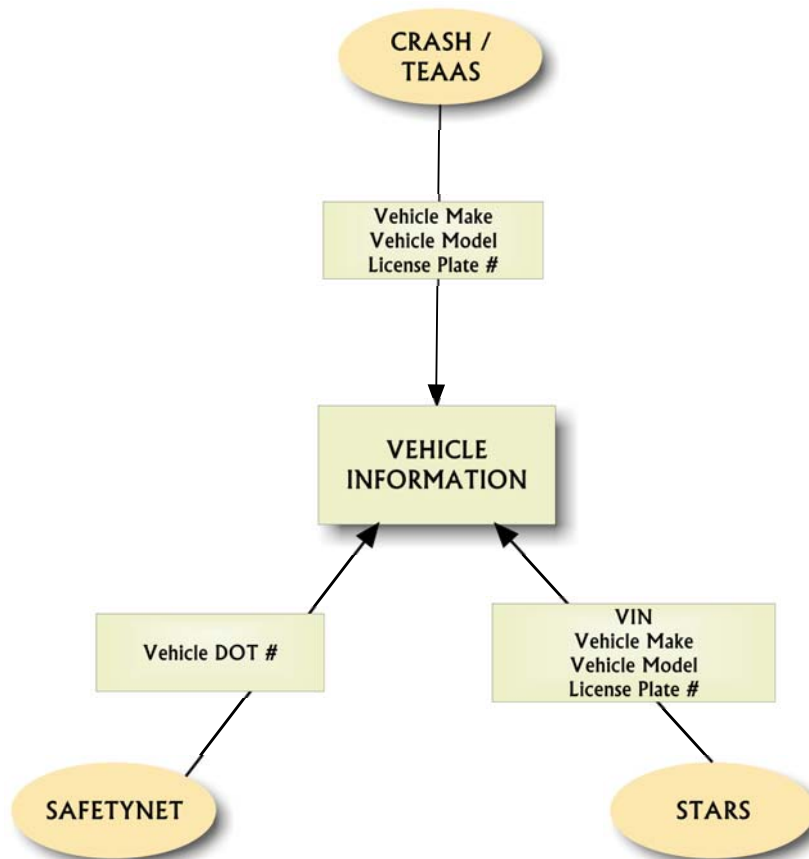

Figure 4: Vehicle Information

Analyst Cautions

The preceding chapters revealed a couple of broad trends that safety analysts need to be aware of before embarking. First, analysts should be aware that most of the safety databases covered in this Guidebook are available only by request through the custodial agency. In only a few cases were data posted online. Analysts should budget for some time for the agency to review and respond to a request. Analysts should also be aware that agencies have a legitimate and often legally-binding interest in maintaining the privacy of the people in the databases. Requests for data should therefore be framed with this privacy interest in mind.

Second, analysts should be aware that the quality of the data in the databases is only as good as the people making the entries. Traffic crashes are hostile and demanding environments, for example, and data entered at the scene of the crash, in the midst of or soon after the chaos, are prone to error. The agencies responding to the questionnaire or in the interview conducted for this effort almost without fail claimed high accuracies for their databases, and the claims are likely true from the agency's vantage point. The authors are confident that most of the agencies responsible for the safety databases in North Carolina faithfully enter into their databases the data they are provided. However, from a broader perspective, comparing safety data in the databases to actual events, analysts should be more skeptical. An outstanding future endeavor of the TRCC would be a program of quality assessment of the databases that make up the system to inform analysts about the nature and extent of errors.